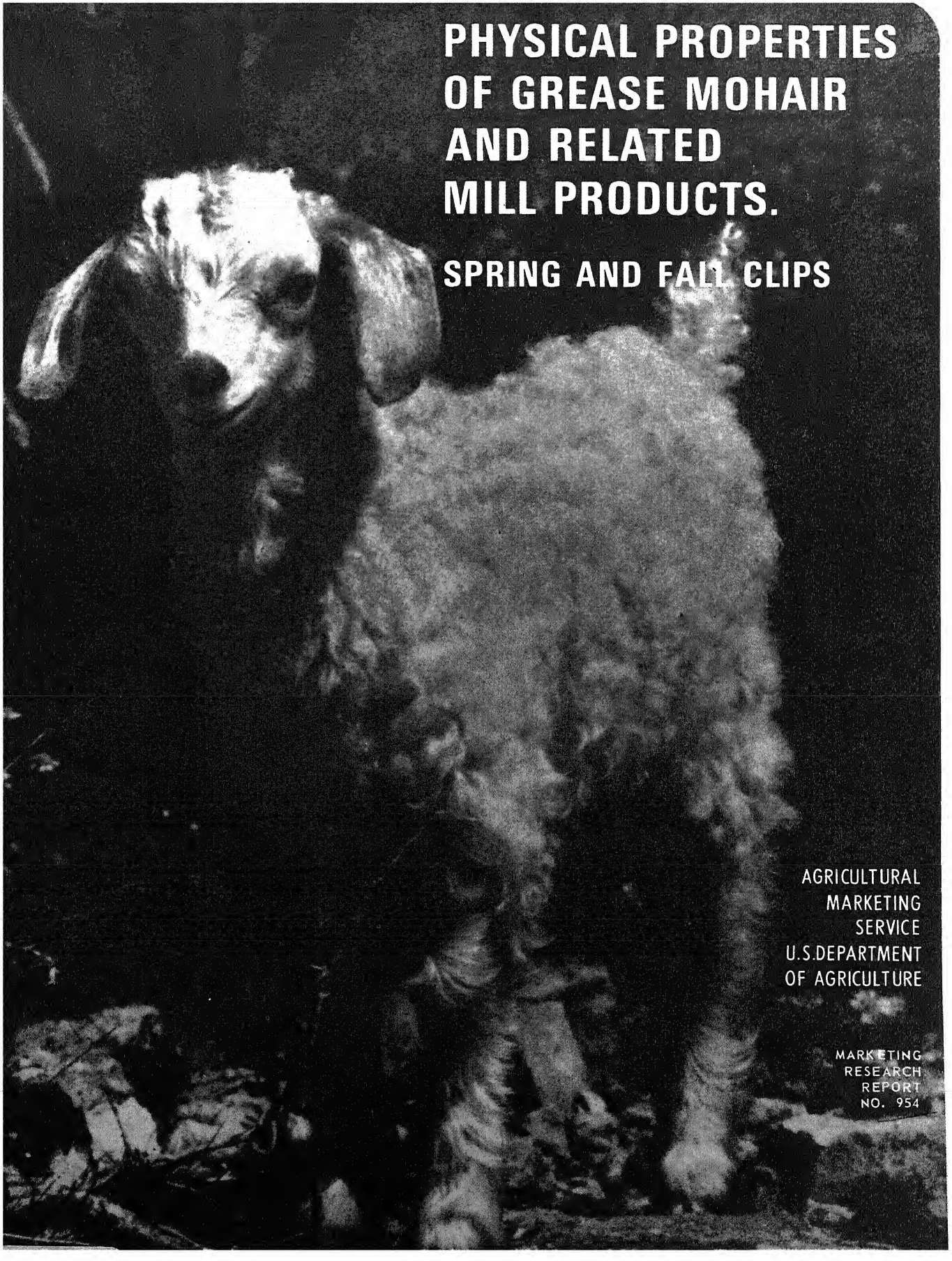

PHYSICAL PROPERTIES OF GREASE MOHAIR AND RELATED MILL PRODUCTS.

SPRING AND FALL CLIPS

AGRICULTURAL MARKETING SERVICE
U.S.DEPARTMENT OF AGRICULTURE

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CONTENTS

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Special credit is given The Mohair Council of America and the domestic mohair handlers, dealers, processors, manufacturers, and others whose participation and cooperation made the study possible. Angora Goat pictures courtesy of Mohair Council of America.

SUMMARY

This study of physical properties of mohair had five major objectives:

(1) To compare the average fiber diameter of grease mohair with the average fiber diameter of the card sliver, top, and noil it produced.

(2) To develop an equation for estimating the average fiber diameter of grease mohair from the average fiber diameter of the mohair top.

(3) To determine the influence of season (spring or fall) of shearing and grade on the yield of clean mohair.

(4) To study the relationship between grease mohair staple length and the fiber length of the top produced.

(5) To determine the percentages of kemp and medullated fibers present in grease mohair, card sliver, top, and noil and the relationships between these percentages and season of shearing and grade.

A major conclusion of this study is that there is a close, predictable relationship between the measurements of grease mohair characteristics and the measurement of the same characteristics in the top produced.

(1) *Fineness.* The grease mohair was finer than the top produced in all lots tested. On the average for all grades studied, the grease mohair was 0.59 micron finer than the resultant top. The differences in average fiber diameter between the grease mohair and the resultant top did not appear to be related to grade.

(2) *Yield.* Results of scouring ½-inch core samples of grease mohair show that grade has little effect on yield of clean mohair. However, the fall clip yielded approximately 5 percent more clean mohair than the spring clip.

(3) *Length.* The average normal (unstretched) grease staple length closely approximated the average fiber length of the resultant top. Staple length did not seem to bear any relationship to grade. The average percentage of stretch of staples for all lots tested was approximately 25 percent. Grade had no influence on percentage of stretch, but spring mohair had about 6 percent more stretch than fall mohair.

(4) *Kemp and medullated fibers.* The combined percentages of kemp and medullated fibers in all grades of spring and fall grease mohair was small, ranging from 0.7 to 2.0, with the fall clip showing about twice as many of these fibers as the spring clip. Grade was not related to the percentage of kemp or medullated fibers. The grease mohair contained approximately the same percentage of these fibers as did the top.

PHYSICAL PROPERTIES OF GREASE MOHAIR AND RELATED MILL PRODUCTS
(SPRING AND FALL CLIPS)

By E. M. Pohle, H. R. Keller, H. D. Ray, C. T. Lineberry, and H. C. Reals*

INTRODUCTION

Mohair—the fiber from the Angora goat—has certain physical and chemical properties which are basic to its commercial value as a textile fiber. The average fiber diameter is the major consideration as this characteristic determines, to a large degree, the type of fabric or product for which the mohair can be used. Other characteristics affecting grease mohair value are its length, its yield of clean mohair, and its strength, luster, color, and character.

Early work in the United States in classifying grease mohair for market was done mainly by warehousemen, merchants, and representatives of the U.S. Department of Agriculture.[1]

Prior to this study only minimal data was available regarding measureable physical properties of grease mohair, card sliver, and top. However, some preliminary fineness measurement work was conducted by the Wool and Mohair Laboratory in 1950, which was used to develop tentative U.S. mohair grade standards.[2] In more recent investigations, Bassett and Engdahl found flock and seasonal differences in mohair length and diameter.[3] Engdahl also found differences among fleeces related to season and age.[4]

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Shearing Angora Goats

Nearly all background work has suggested that mohair be made into matchings—sorted into lots that are relatively uniform in fineness and length—in order to be most acceptable on the commercial market. Therefore, the lots of mohair included in this study involved only those made into commercial mohair matchings.[5] Also, since Texas produces approximately 98 percent of the mohair in the United States, only mohair from that State was used.

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[1] This work was reported by W. von Bergen and H. R. Mauersberger, American Wool Handbook, American Wool Handbook Co., New York, N.Y., 1938.

[2] The Laboratory's report is reproduced in the American Wool Handbook, op. cit. In addition, the Handbook describes market types used in mohair marketing in South Africa and Turkey.

[3] Bassett, J. W. and Engdahl, G. R. Sheep and Angora Goat, Wool, and Mohair. Texas A&M Research Center, 1969.

[4] Engdahl, G. R. Mohair Variation on the Angora Goat. Unpublished thesis, Texas A&M, 1970.

[5] A similar study on wool was conducted by the USDA Wool and Mohair Laboratory and reported in two publications: E. M. Pohle, D. D. Johnston, H. R. Keller, W. A. Mueller, H. D. Ray, and H. C. Reals, Value-Determining Physical Properties and Characteristics of Domestic Wools, USDA Marketing Research Report No. 211, 1958. D. D. Johnston, H. R. Keller, W. A. Mueller, H. D. Ray, H. C. Reals, and E. M. Pohle, Physical Measurements and Their Application in Describing Wool, USDA Marketing Research Report No. 256, 1958.

The work was conducted by the Livestock Division's Wool and Mohair Laboratory at Denver and was financed, in part, by the Mohair Council of America. The study also was endorsed by the Texas Sheep and Goat Raisers Association, the National Wool Growers Association, the American Society for Testing and Materials (ASTM), and by domestic mohair handlers, dealers, processors, and manufacturers.

PROCEDURE

The Mohair Council of America purchased lots of both spring and fall mohair matchings from handlers and dealers in the major mohair-producing areas of Texas. This selection gave a broad representation of the various production areas.

The matchings were shipped to the San Angelo Wool Processing Company plant at San Angelo, Texas, and to the Brady Combing Company (subsidiary of Hudson Combing Company, Hudson, Mass.), Brady, Texas. The mohair processed by the Brady Combing Company was scoured by the Roddie Scouring Company, Brady. All of the grease mohair lots were processed into finished top.

Other commercial processors and manufacturers contributed to this study by furnishing samples of card sliver, top, and noil from processing lots in their plants.

MOHAIR PROPERTIES

Fineness

Grease mohair samples—along with samples from the resultant card sliver, top, and noil—were available on 69 lots. Since mohair and wool are very similar, the procedures for sampling and testing for fineness were carried out in accordance with USDA Methods for Determining Grade of Wool[6] and USDA Methods for Determining Grade of Wool Top.[7] The noil was sampled and tested following the procedures for core residue.[6] Each lot tested was assigned a grade according to the grade of top it produced, based on ASTM average fiber diameter specifications for grade of mohair top.[8]

The average fiber diameter data from the 69 lots, presented by grade in Table 1 and shown graphically in Figure 1, demonstrates the fineness relationships of the mohair top, grease mohair, card sliver, and noil. The grease mohair fineness for these lots averaged 0.59 micron finer than the top it produced. The correlation between the fineness of grease wool and top was very high—r = 0.98. The card sliver average was 0.15 micron coarser than the grease mohair and 0.44 micron finer than the top it produced. The differences in average fiber diameter of the grease mohair, card sliver, and top were not related to grade. Averaging all lots tested, the noil was 3.11 microns finer than the grease mohair.

The mohair processing industry supplied samples for testing from an additional 41 lots. Representing each lot were card sliver, top, and noil samples, but no grease mohair samples. The average fiber diameter results from the additional 41 lots were combined with those from the 69 lots previously discussed, making a total of 110 lots.

The average fiber diameter differences of the top, card sliver, and noil for the 110 lots—shown in Table 2—are very similar to these same differences in the 69 lots as shown in Table 1. For example, in Table 2, the difference in the average diameter between the top and card sliver is 0.37 micron, very close to the 0.44 micron observed for the 69 lots. For the 110 lots, the correlation coefficient between the fineness of card sliver and top was r = 0.99.

Additional grease mohair fiber fineness data for the 69 lots is summarized, by grade, in Table 3. This data and the average fiber diameter data from the corresponding top samples

[6] Official Standards of the United States for Grades of Wool, S.R.A.—C&MS 135, April 1966.

[7] USDA Grade Standards for Wool Top, M.B. No. 53, March 1971.

[8] Society for Testing and Materials, American. (Committee D-13 on Textiles), Standard Specifications for Fineness of Mohair Top and Assignment of Grade. D1381-69.

–*Average fiber diameter of mohair top, grease mohair, card sliver, and noil for 69 lots, by grade.*

Grade	No. lots	Average fiber diameter			
		Mohair top	Grease mohair	Card sliver	Noil
		Microns	*Microns*	*Microns*	*Microns*
.....	10	24.62	24.19	24.11	22.21
.....	11	26.45	25.91	26.16	23.88
.....	10	28.35	27.22	27.85	24.45
.....	2	31.28	30.78	30.53	26.00
.....	8	32.93	32.51	32.45	28.89
.....	12	34.49	34.09	34.18	30.16
.....	10	36.22	34.99	35.63	31.80
.....	6	38.41	38.29	37.92	33.44
-all lots		31.18	30.59	30.74	27.48

–*Average fiber diameter of mohair top, card sliver, and noil for 110 lots, by grade.*

Grade	No. lots	Average diameter		
		Mohair top	Card sliver	Noil
		Microns	*Microns*	*Microns*
.....	10	24.62	24.11	22.21
.....	12	26.46	26.14	23.88
.....	14	28.51	28.14	24.63
.....	4	30.48	29.79	26.96
.....	12	32.85	32.49	29.07
.....	23	34.58	34.30	29.90
.....	24	36.41	36.13	31.32
.....	11	38.41	37.79	33.12
-all lots		32.46	32.09	28.31

-*Average fiber diameter, standard deviation, coefficient of variation, and fiber distribution by diameter groupings for 69 lots of grease mohair, by grade*

ıde	No. lots	Fiber diameter			Fiber distribution[1]				
		Average	Standard deviation	Coefficient of variation	30 u & under	40 u & under	30.1 u & over	40.1 u & over	50.1 u & over
		Microns	*Microns*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
.....	10	24.19	7.02	29.02	84.09	---	15.91	2.08	---
.....	11	25.91	7.90	30.49	75.12	---	24.88	3.81	---
.....	10	27.22	7.70	28.29	67.98	---	32.02	4.66	---
.....	2	30.78	8.80	28.59	45.35	---	54.65	12.83	---
.....	8	32.51	8.80	27.07	---	82.70	---	17.30	2.35
.....	12	34.09	9.32	27.34	---	77.58	---	22.42	4.42
.....	10	34.99	9.22	26.35	---	72.96	---	27.04	5.56
.....	6	38.29	10.43	27.24	---	58.56	---	41.44	12.67

: diameter groupings are those in ASTM mohair top specifications for the respective grades.

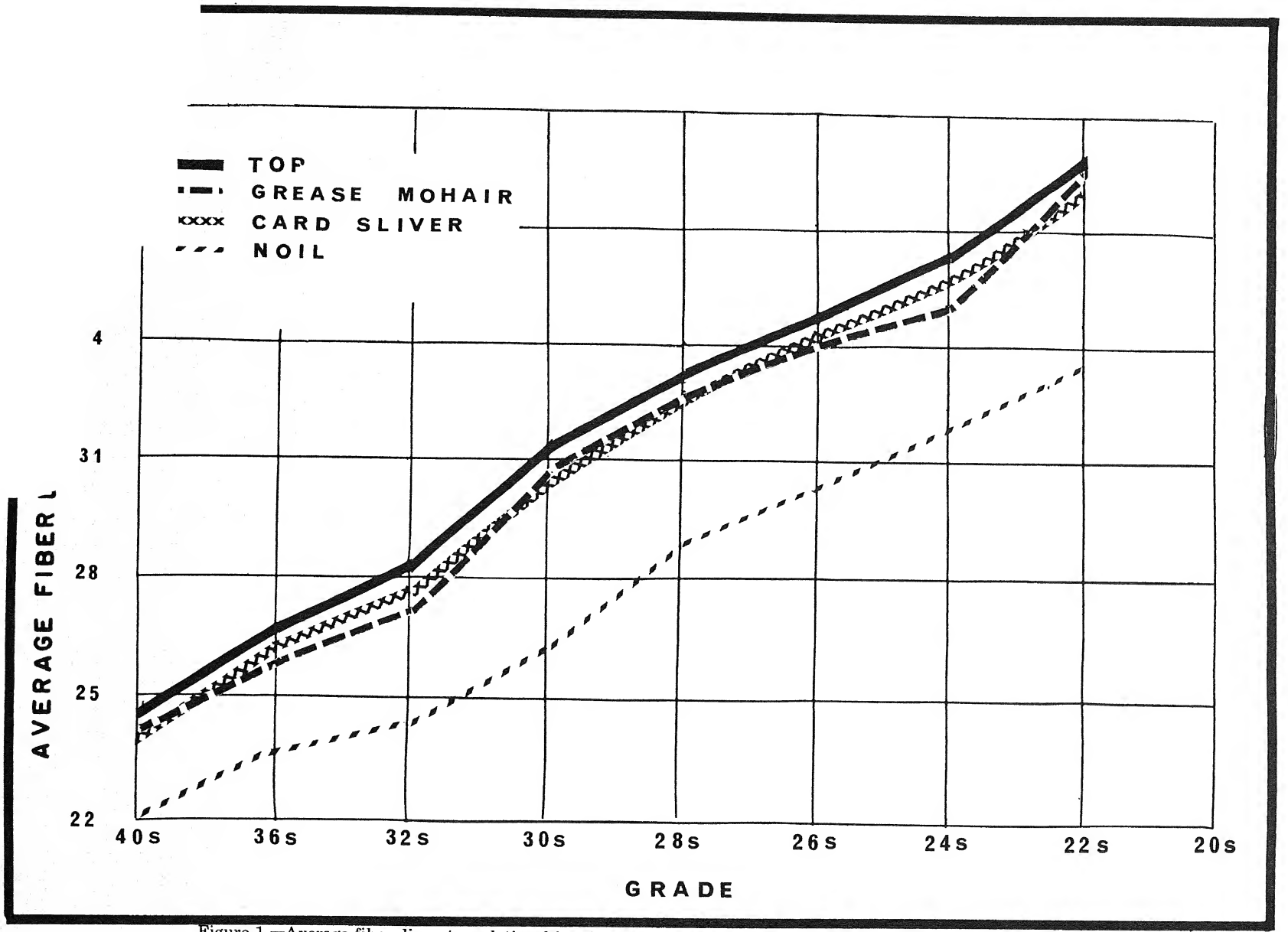

Figure 1.—Average fiber diameter relationship of grease mohair, top, card sliver, and noil for 69 lots, by grade. DN-3313

were used to develop the official U.S. standards for grades of grease mohair.[9] This was done as follows: A regression equation was calculated for estimating the average fiber diameter of grease mohair from the average fiber diameter of the top. The equation was: Estimated average fiber diameter of grease mohair, in microns = 0.58 + 1.0 (average fiber diameter of mohair top, in microns).[10] This estimating equation was then applied to the average fiber diameter limits of each of the ASTM mohair top grades to establish the average fiber diameter limits of the corresponding grades of grease mohair. The maximum standard deviation values for each of the official grades of grease mohair were adapted from the standard deviation data of the grease mohair shown in Table 3.

Yield

Yield data was obtained for 33 of the 69 lots—16 spring-shorn and 17 fall-shorn. Table 4 and Table 5 show the data related to yields of clean mohair for the spring and fall-shorn matchings classified according to the grade assigned the resultant top. Yields were obtained from ½-inch core samples (see Figure 2) processed according to a standard procedure.[11] There was no consistent relationship between grade and yield. However, the fall clip yielded about 5 percent more clean mohair than the spring clip. The average yield for the fall clip was 80.20 percent and for the spring

[9] Official Standards of the United States for Grades of Grease Mohair, Federal Register, Vol. 36, No. 129, pp. 12681-12685, July 3, 1971.

[10] Keller, H. R.; Ray, H. D.; Lineberry, C. T.; and Pohle, E. M. Fineness Relationship of Grease Mohair, Card Sliver, and Top. Textile Research Journal, Vol. 41, No. 2, 1971.

[11] Society for Testing and Materials, American (Committee D-13 on Textiles), Standard Method of Test for Wool Content of Raw Wool—Laboratory Scale. D584-69.

Table 4.—Yields of spring mohair matchings, by grade.

Grade	Lot number	Grease weight	½-inch core yields 14%[1]	Mill yields		
				Top-noil-waste, 14%[1]	Top on top & noil	Noil on top & noil
		Pounds	*Percent*	*Percent*	*Percent*	*Percent*
40s	377	786	74.60	72.90	92.7	7.3
	378	659	74.23	77.69	93.9	6.1
	379	998	71.85	79.46	93.3	6.7
	380	879	78.39	75.88	94.1	5.9
Average		830	74.77	76.48	93.5	6.5
36s	381	762	73.41	76.25	94.4	5.6
	382	855	75.91	70.99	91.0	9.0
	383	998	71.95	71.84	95.0	5.0
Average		872	73.76	73.03	93.5	6.5
32s	384	886	77.32	81.83	96.0	4.0
	385	921	74.43	75.03	93.3	6.7
	386	789	75.01	75.16	93.4	6.6
	387	998	72.60	73.84	93.4	6.6
	388	849	75.95	72.91	93.1	6.9
Average		889	75.06	75.75	93.8	6.2
28s	235	1000	74.35	76.00	94.9	5.1
26s	236	1000	76.70	76.10	95.1	4.9
	237	1022	79.64	83.95	96.5	3.5
Average		1011	78.17	80.03	95.8	4.2
24s	2704	855	---	80.35	96.3	3.7
Average—All Lots		891	75.09	76.26	94.2	5.8

[1] Standardized to 12% Moisture and 2% Impurities.

Table 5.—Yields of fall mohair matchings, by grade.

Grade	Lot number	Grease weigh	½-inch core yields 14%[1]	Mill yields		
				Top-noil-waste, 14%[1]	Top on top & noil	Noil on top & noil
		Pounds	*Percent*	*Percent*	*Percent*	*Percent*
40s	401	861	76.20	76.88	92.6	7.4
	402	1084	77.54	77.71	93.6	6.4
	403	998	81.76	83.50	94.6	5.4
	404	1010	81.91	79.64	93.2	6.8
	405	998	82.60	75.13	89.3	10.7
	406	1108	83.80	76.90	92.9	7.1
Average		1010	80.64	78.29	92.7	7.3
36s	409	1380	80.99	72.65	94.6	5.4
	413	998	79.99	80.91	97.1	2.9
	414	731	80.17	80.59	94.5	5.5
Average		1036	80.38	78.05	95.4	4.6
32s	408	1037	80.31	76.64	94.8	5.2
	410	1044	82.80	75.38	96.1	3.9
	412	1068	77.30	74.87	94.0	6.0
Average		1050	80.14	75.63	95.0	5.0
30s	411	998	80.08	76.60	95.7	4.3
26s	MC-LD	1775	81.26	85.84	92.8	7.2
24s	MC-MD	1754	76.33	76.86	93.5	6.5
22s	2754	842	---	81.23	95.1	4.9
	MC-CL	1825	---	81.56	95.8	4.2
Average		1334	---	81.40	95.5	4.5
Average—All Lots		1148	80.20	78.41	94.1	5.9

[1] Standardized to 12% Moisture and 2% Impurities.

clip it was 75.09 percent. These results are very similar to those reported by von Bergen on a number of lots of Texas kid and adult mohair in 1946-47—he found an approximate 4 percent higher yield for the fall clip of mohair.[12] Similar yield tests were conducted on South African (Cape) mohair by Van Wyk, Kritzinger, and Veldsman in 1957. These men found an approximate 4 percent higher yield for their summer clip mohair.[13] The South African summer clip corresponds to the fall clip in the United States.

Since the lots processed in this study were quite small, the ½-inch core yields are believed to be more representative of the actual yields of clean mohair than the top, noil, and waste mill yields. When processing small lots reliable figures are difficult to obtain because it is impractical to apply procedures which allow complete product recovery.

After scouring, carding, and combing are completed, only top and noil remain as end products. There was practically no difference between the spring and fall clips in the average percentage in weight of top based on the total weight of top and noil produced. The average percentage of top on top and noil was approximately 94 percent for both spring and fall mohair.

Length

Length measurements of grease mohair and the resultant mohair top were made on 31 of the 69 grease mohair lots. Each lot of grease

[12] von Bergen, W. and Mauersberger, H. R. American Wool Handbook. Textile Book Publishers, Inc., New York, N.Y. 1948.

[13] Van Wyk, T. P. and Kritzinger, C. C. and Veldsman, D. P. Studies on Summer and Winter Mohair Clips. S. African Wool Textile Research Institute Technical Report No. 14, 1958.

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Figure 2.—Using a ½-inch diameter coring tool to take a core sample from a well-packed bag of grease mohair.

mohair was sampled by drawing handfuls at random from the pile of matchings and combining these into a composite sample. Twenty grease staples were then drawn at random from each composite sample and measured—unstretched and stretched—in accordance with procedures described by Johnston and co-workers in 1957.[14] (See Figure 3.)

This data is summarized as lot averages, by grade, in Table 6. From this it can be seen that,

[14] Johnston, Donald D., Ray, H. Dean, and Pohle, Elroy M. Staple Length Sampling Schedules for Raw Wool Packaged in Bags. USDA—AMS-182, May 1957.

BN-38815

Figure 3.—Measuring length of grease mohair staples. Balance and Suter length apparatus for measuring fiber length of top are visible in background.

Table 6.—Normal staple length, standard deviation, coefficient of variation, stretched length, percentage of stretch, and fiber length of top for mohair matchings for 31 lots, by grade.[1]

Grade and clip	Lot number	Normal staple length			Stretched staple length		Top fiber length
		Average	Standard deviation	Coefficient of variation	Average	Stretch	Average
		Inches	*Inches*	*Percent*	*Inches*	*Percent*	*Inches*
40s	10	3.40	.97	28.5	4.24	25.1	3.41
36s	7	3.64	1.04	28.0	4.60	26.4	3.68
32s	8	3.90	1.10	28.2	4.87	24.6	3.90
30s	1	3.27	.59	18.0	4.06	24.2	3.70
28s	1	3.20	.77	24.1	4.21	31.6	3.88
26s	2	3.88	.78	20.1	4.76	22.7	3.88
.....	1	3.69	.77	20.9	4.73	28.2	3.91
.....	1	4.14	1.03	24.9	4.95	19.6	4.15
	All lots	3.64	1.11	30.49	4.57	25.5	3.72

staples were measured per lot.

for all lots combined, the average normal (unstretched) staple length—3.64 inches—is much closer to the average length of the top—3.72 inches—than is the average stretched staple length of 4.57 inches.[15] Similar relationships also are evident for each grade.

The average stretched length of the spring and fall-shorn mohair was about 25 percent longer than the normal length. However, the spring-shorn mohair had about 6 percent more stretch.

Length information for both spring and fall matchings is presented in Table 7. The average normal staple lengths of the spring and fall clips were 3.72 inches and 3.56 inches, respectively. The corresponding lengths of top were 4.05 inches and 3.42 inches. The fall clip also was more uniform in staple length than the spring clip, as evidenced by the fact that it had a smaller standard deviation and coefficient of variation than the spring clip. The coefficient of variation in length for the fall clips was 21.60 percent and 28.50 percent for the spring clips. This is consistent with similar results from a study on Cape mohair.[16]

Kemp and Medullated Fibers

Mohair may have varying amounts of unsound and malformed fibers interspersed among the sound fibers. These objectionable fibers ordinarily are referred to as kemp and medullated fibers. These fibers have a hollow canal, known as the medulla, through the center of the fiber. Sound mohair fibers have no such canal. Kemp and medullated fibers also have varying degrees of an opaque, chalky appearance and do not reflect light nor accept dye as do sound mohair fibers. Kemp fibers are more brittle than sound fibers and this makes them subject to breakage in the carding and combing operations and causes difficulties in spinning. Also, they generally are coarse and short and tend to be flattened and ribbon-like. In this study, the differentiation between kemp and medullated fibers was arbitrary: Those fibers having a medulla which included 65 percent or more of the fiber diameter were designated as kemp; all other fibers having a smaller medulla were called medullated. (See Figure 4 for illustration.)

Data on the percentages of these unsound fibers in grease mohair, mohair top, card sliver, and noil was available for the 69 lots. In 34 of these lots, information also was available on time of shearing. Table 8 summarizes the incidence of kemp and medullated fibers for the 34 lots by grade and season of shearing. Grade of mohair had no apparent influence on the percentage of kemp and medullated fibers. However, the incidence of these fibers was associated with time of shearing—approximately twice as many kemp and medullated fibers were found in the fall clip as were found in the spring clip. For example, the total of these objectionable fibers in the top produced from spring-shorn mohair was 0.9 percent but it was 1.5 percent for the top produced from mohair shorn in the fall. Approximately the same relationships also prevailed for grease mohair and card sliver from spring and fall shearings. In these products, the greatest percentage of objectionable fibers occurred in the fall-shorn mohair.

For all 69 lots, the average percentages of kemp and medullated fibers are shown in Table 9. It is interesting to note that the average percentages of these objectionable fibers for all 69 lots were essentially the same for grease mohair, card sliver, and top: 0.3 or 0.4 percent for kemp and 1.2 or 1.3 percent for medullated fibers. Similar but somewhat less consistent relationships were also noted for the individual grade groups. This indicates that the percentages of kemp and medullated fibers in grease mohair samples permit quite accurate predictions of these same fiber percentages in the finished top. About double the quantity of kemp and medullated fibers was found in the noil as was found in the other products. This increase was expected because these fibers are quite subject to breakage and subsequent removal as noil in the combing operation.

[15] The top was measured by using a standard measurement procedure and employing the Suter apparatus: Refer to American Society for Testing and Materials, Committee D-13 on Textiles, Standard Method of Test for Length of Fiber in Wool Top, D519, 1968.

[16] Van Wyk, Kritzinger, and Veldsman, Studies on Summer and Winter Mohair Clips, op. cit.

Table 7.—Normal staple length, standard deviation, coefficient of variation, stretched length, percentage of stretch and fiber length of top, by grade, for spring and fall mohair matchings.

Grade and clip	Lot number	Normal staple length			Stretched staple length		Top fiber length
		Average	Standard deviation	Coefficient of variation	Average	Stretch	Average
		Inches	*Inches*	*Percent*	*Inches*	*Percent*	*Inches*
40s - Spring	377	3.60	1.10	30.5	4.67	29.7	3.91
	378	3.30	.65	19.7	4.31	30.6	3.90
	379	3.65	.88	24.1	4.67	27.9	4.14
	380	3.88	1.19	30.7	5.02	29.4	4.05
All lots	4	3.61	1.05	29.1	4.66	29.4	4.00
40s - Fall	401	3.13	.64	20.4	3.73	19.2	3.02
	402	2.93	.68	23.2	3.61	23.2	2.99
	403	3.23	.56	17.3	3.90	20.7	2.90
	404	3.30	.73	22.1	4.01	21.5	2.94
	405	3.29	.57	17.3	4.05	23.1	2.95
	406	3.68	.64	17.4	4.46	21.2	3.37
All Lots	6	3.26	.70	21.5	3.96	21.5	3.02
36s - Spring	381	3.79	.91	24.0	4.80	26.6	4.08
	382	3.59	1.07	29.8	4.65	29.5	4.13
	383	3.92	.86	21.9	5.22	33.2	4.15
All Lots	3	3.76	1.16	30.9	4.89	29.8	4.12
36s - Fall	407	3.70	.52	14.1	4.53	22.4	3.44
	409	3.27	.70	21.4	4.25	30.0	3.23
	413	3.50	.60	17.1	4.28	22.6	3.30
	414	3.77	.52	13.8	4.47	18.6	3.46
All Lots	4	3.55	.73	20.6	4.38	23.4	3.35
32s - Spring	384	3.83	1.00	26.1	4.86	26.9	4.14
	385	3.38	1.03	30.5	4.36	29.0	3.94
	386	3.62	1.08	29.8	4.61	27.3	4.07
	387	3.83	1.09	28.5	5.07	32.4	4.21
	388	4.52	1.16	25.7	5.50	21.7	4.00
All Lots	5	3.83	1.12	29.2	4.88	27.5	4.07
32s - Fall	408	4.30	.74	17.2	5.00	16.3	3.68
	412	3.58	.42	11.7	4.38	22.3	3.41
	410	4.25	.69	16.2	5.25	23.5	3.76
All Lots	3	4.04	.69	17.1	4.87	20.7	3.61
30s - Fall	411	3.27	.59	18.0	4.06	24.2	3.70
28s - Spring	235	3.20	.77	24.1	4.21	31.6	3.88
26s - Spring	236	4.15	.89	21.4	5.00	20.5	4.00
	237	3.62	.64	17.7	4.53	25.1	4.19
All Lots	2	3.88	.78	20.1	4.76	22.8	4.09
26s - Fall	MC-LD	---	---	---	---	---	3.47
24s - Spring	2704	3.69	.77	20.8	4.73	28.2	4.11
24s - Fall	MC-MD	---	---	---	---	---	3.72
22s - Fall	2754	4.14	1.03	24.9	4.95	19.6	3.81
	MC-CL	---	---	---	---	---	4.50
All Lots - Spring		3.72	1.06	28.50	4.76	28.10	4.05
All Lots - Fall		3.56	.77	21.60	4.33	21.89	3.42
All Lots		3.64	1.11	30.49	4.57	25.50	3.72

Table 8.—Average percentage of kemp and medullated fibers, by grade, for 34 lots of spring and fall mohair matchings

Grade	Clip	No. lots	Top			Grease mohair			Card sliver			Noil		
			Kemp	Med.	Total	Kemp	Med.	Total	Kemp	Med.	Total	Kemp	Med.	Total
			Pct.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
40s	Spring	4	0.1	0.5	0.6	0.1	0.6	0.7	0.1	0.5	0.6	0.2	1.3	1.5
	Fall	6	.7	1.1	1.8	.4	.9	1.3	.3	1.4	1.7	1.1	2.4	3.5
36s	Spring	3	.1	.5	.6	.1	.6	.7	.1	.4	.5	.1	1.3	1.4
	Fall	4	.5	1.3	1.8	.4	1.0	1.4	.7	1.1	1.8	.9	3.0	3.9
32s	Spring	5	.1	.6	.7	.1	.6	.7	.1	.6	.7	.2	1.7	1.9
	Fall	3	.2	.9	1.1	.3	1.3	1.6	.6	.8	1.4	1.3	2.4	3.7
30s	Spring	0	---	---	---	---	---	---	---	---	---	---	---	---
	Fall	1	.1	.8	.9	.2	.5	.7	.5	.7	1.2	1.4	1.6	3.0
28s	Spring	1	.8	1.2	2.0	.1	.7	.8	.0	.9	.9	.4	2.0	2.4
	Fall	0	---	---	---	---	---	---	---	---	---	---	---	---
26s	Spring	2	.2	1.0	1.2	.3	.8	1.1	.2	.6	.8	.5	1.7	2.2
	Fall	1	.4	.6	1.0	.2	.8	1.0	.3	.6	.9	.8	2.8	3.6
24s	Spring	1	0	1.9	1.9	.1	1.5	1.6	.6	1.9	2.5	1.2	2.8	4.0
	Fall	1	.1	1.0	1.1	.5	.8	1.3	.8	1.0	1.8	.6	2.6	3.2
22s	Spring	0	---	---	---	---	---	---	---	---	---	---	---	---
	Fall	2	.5	.9	1.4	.4	1.2	1.6	.4	.7	1.1	1.8	2.1	3.9
Average Spring Lots			.2	.7	.9	.1	.7	.8	.1	.6	.7	.3	1.6	1.9
Average Fall Lots			.5	1.0	1.5	.4	1.0	1.4	.4	1.1	1.5	1.1	2.5	3.6
Average—All Lots			.3	.9	1.2	.3	.8	1.1	.3	.9	1.2	.7	2.1	2.8

Table 9.—Average percentages of kemp and medullated fibers, by grade, for 69 lots of mohair matchings.

Grade	No. lots	Top			Grease mohair			Card sliver			Noil		
		Kemp	Med.	Total	Kemp	Med.	Total	Kemp	Med.	Total	Kemp	Med.	Total
		Pct.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
40s	10	0.5	0.9	1.4	0.3	0.8	1.1	0.3	1.1	1.4	0.8	2.0	2.8
36s	11	.4	1.3	1.7	.3	1.1	1.4	.4	1.1	1.5	.8	2.6	3.4
32s	10	.2	.9	1.1	.5	1.4	1.9	.3	.9	1.2	.6	2.1	2.7
30s	2	.1	1.0	1.1	.3	1.2	1.5	.6	1.2	1.8	1.2	2.3	3.5
28s	8	.2	1.2	1.4	.3	1.4	1.7	.2	1.5	1.7	.7	2.7	3.4
26s	12	.3	1.2	1.5	.3	1.4	1.7	.7	1.1	1.8	1.6	3.3	4.9
24s	10	.2	1.7	1.9	.2	1.4	1.6	.3	1.6	1.9	1.3	3.1	4.4
22s	6	.4	1.7	2.1	.3	1.5	1.8	.3	1.4	1.7	1.2	2.9	4.1
Average—All Lots		.3	1.2	1.5	.3	1.3	1.6	.4	1.2	1.6	1.0	2.7	3.7

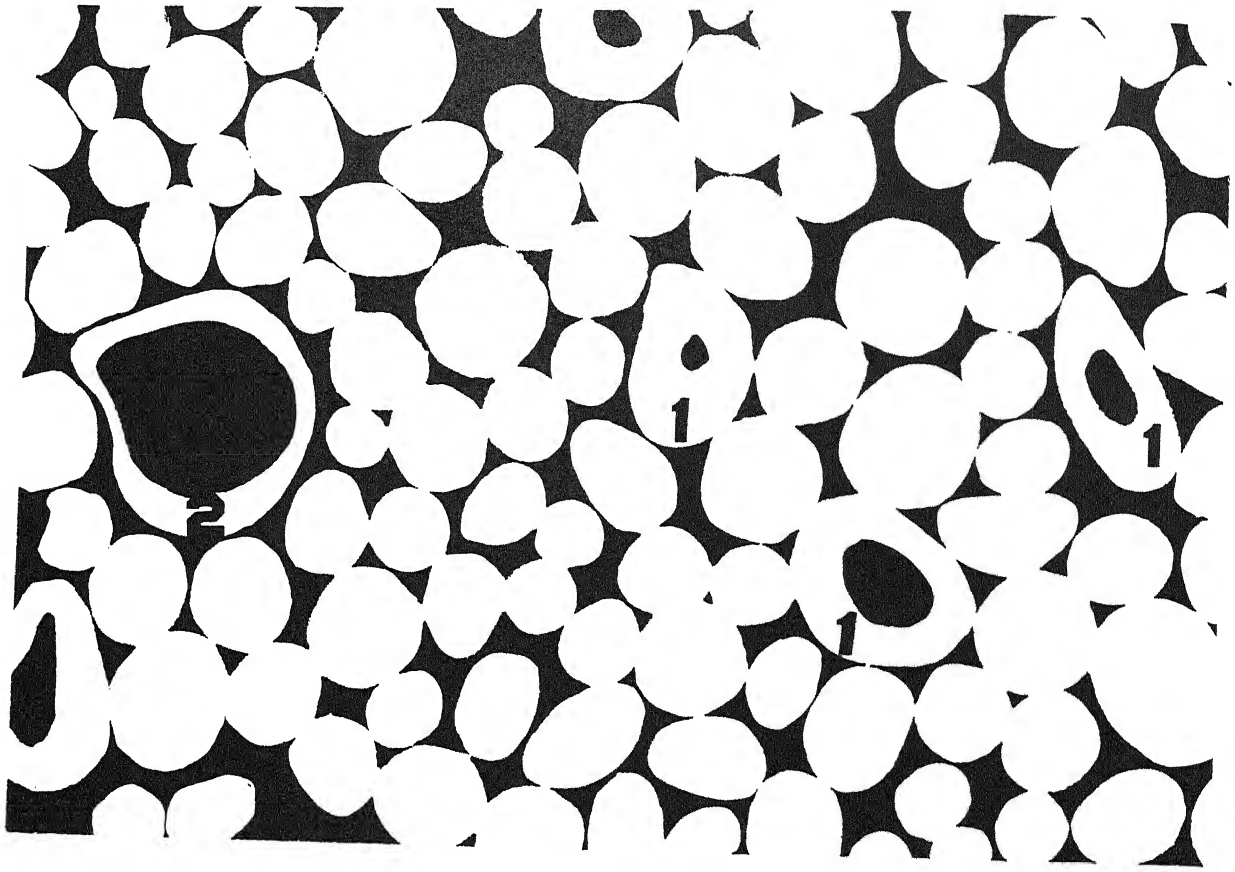

Figure 4.—Microphotograph of a cross-section of mohair fibers showing (1) medullated, (2) kemp, and sound fibers.

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